UNITED STATES DISTRICT COURT

DISTRICT OF NEW JERSEY

----------x

JUAN DUARTE, BETSY DUARTE and N.D., Infant, by Parents and Natural Guardians JUAN DUARTE and BETSY DUARTE, LEROY NOBLES and BETTY NOBLES, on Behalf of Themselves and All Others Similarly Situated,

Plaintiffs,

v.

UNITED STATES METALS REFINING COMPANY, et al.,

Defendants.

Civil Action No. 2:17-cv-01624

----------x

VIDEOTAPED DEPOSITION OF STEPHEN EMSBO-MATTINGLY

Washington, D.C.

Wednesday, September 4, 2019

Job No. 225903

GOLKOW LITIGATION SERVICES

T 877.370.3377 | F 917.591.5672

deps@golkow.com

Q. Okay. And 370 was analyzed by Geller EMPA, correct? Sorry. It was not analyzed.

A. Correct.

Q. Okay. And, therefore, you could not determine whether it reflected a USMR emission or not, correct?

A. That is correct.

Q. Okay. Can you describe the forensic microscopy analytical method that you used?

A. Sure. For all of it?

Q. Yeah, how you reached your conclusions in this case, your opinions in this case.

A. Okay. I think this is explained in the report, so if you -- I'm not sure what part of that is not clear, but I'm happy to look back on it and tell you where it is in the report.

Q. Okay. I'd just like for you to describe for the jury what you did.

A. Okay. So the first phase of the investigation was one that was focused on a selection of samples representing the high and the low concentrations -- the highest and a few of the lowest concentrations. This is explained on page 9, section 2.1, Phase 1.

It goes on to say that in Phase 2 there were

regulatory drivers were lead and arsenic. So we were measuring copper, but it was not a central component of the investigation --

Q. Okay.

A. -- because there are so many other sources of copper.

Q. Okay. What were the other sources of copper in Carteret?

A. Well, I mean, copper is a component of urban fill. I mean, copper -- you have copper wires, you have copper electronics, you have copper piping. There's a lot of copper in areas like this.

Q. What's your basis for saying that copper is a component of urban fill?

A. Personal experience, New Jersey DEP guidance.

Q. Okay. The New Jersey DEP fill guidance doesn't actually list copper, does it.

A. I think it's in there, in the 1993 guidance.

Q. Okay. Anything else?

A. Let's leave it there for now.

Q. Okay. So you didn't look at copper -- well, you looked at copper, but you didn't focus on copper because there are so many other sources of

copper in Carteret, right?

MR. SUTHERLAND: Object to the form.

A. So let me just back up. The reason we don't -- we are not focused on the copper is because the copper smelter is designed to recover copper, right. It's a trace component of some of their waste, so we track it. But the copper is also used so widely in just normal, everyday life that what we decided to do was to focus on those things that are motivating the cleanup, which is lead and arsenic. I don't think copper has a lot of excedences in the area, so it wasn't a central part of our selection criteria.

Q. Okay. Is it your understanding that copper was a trace component in the emissions from the smelter?

A. It can be, yes.

Q. Okay. That it was.

A. It was, yes.

Q. Okay. And so you used methods that could identify copper, right? I always get this wrong, so I have to go back to your table. But either the EDS or the EMPD, right? EMPA?

A. Electron microprobe, yes.

Q. Okay. And where did those methods, if

anywhere, identify copper?

A. The copper would be identified on the spectra, which is in the laboratory data.

Q. Okay. But you did not focus on that, so you can't tell me; is that what's going on? Can you tell me properties where you found copper?

A. Not off the top of my head.

Q. Okay. Can you tell me properties where you found -- well, can you tell me where you found arsenic? Did you find arsenic?

A. Yes.

Q. Okay. Where did you find arsenic?

A. I didn't do a map of the arsenic.

Q. Okay. If we look at your Table 3, is it fair to say you found arsenic in sample 335, and possibly arsenic in 382?

A. Yes. So just to be clear, the sample ID on row 335 is 311-F01-06-EG-G0079, and that is a location where we did identify arsenic.

I'm sorry. What was the second one?

Q. You identified a source of arsenic, right?

A. Correct.

Q. And that was the -- was that the arsenopyrite?

A. The arsenopyrite is in Fig. 14. That

sample is the 3110-F01-06-EG-G0079. So we did identify the arsenic there.

Q. Okay. So you identified arsenic in -- sorry -- a source of arsenic in two of your analyses, right, and then a possible source in a third, correct?

A. That is correct.

Q. Okay. And that's out of your 400 plus samples, right?

A. So let me explain what we're doing here. We did not --

Q. Is that right?

MR. SUTHERLAND: Let him finish his answer, please.

MR. NIDEL: That wasn't an answer. It was let me explain what we're doing when I asked him a yes or no question. If you want to ask him questions, you can.

MR. SUTHERLAND: If he needs to provide an explanation to an answer --

MR. NIDEL: He started with let me explain.

MR. SUTHERLAND: I'm got going to argue with you, Chris. You need to let him answer the question.

MR. NIDEL: No, I don't need to let him give narrative responses.

MR. SUTHERLAND: If it requires a narrative response, you do.

MR. NIDEL: No, I don't.

MR. SUTHERLAND: I'm going to instruct the witness to answer the question the way he feels like it's appropriate so he can give a complete answer, notwithstanding improper instruction of opposite side counsel.

Q. I'm going to strike the question, and I'm going to ask, you found evidence of arsenic -- evidence of a source of arsenic in two of your samples and possible evidence of arsenic in one additional sample, correct?

A. That is correct.

Q. Okay. And you found -- well, what fill materials contained lead?

A. So what we need to discuss at this point is the fact that the emissions from the copper smelter will be a -- it will be in a particulate form with small size and certain morphological features.

So after looking in the samples and not finding them for arsenic, we then said, well, where could this arsenic be, because in these samples that

we did test, we were detecting higher levels of arsenic in the samples.

So I used the additional technique of the microprobe to look on the interior of the soil particles. So you'll see, for example, in Fig. 17, that we have a particle here where we have -- we're not looking at the surface so much as we're looking at the interior. And this gets at some of the -- an important distinction for how we are looking at this.

The exterior where all of the small particles are is what we've done for most of the samples, but in this case what we've done is we've looked at the interior of the particle and we know where the outside of the particle was and where the inside was. That's self-explanatory when you look at the picture.

So what's happening here is we are measuring the arsenic in the cracks and the fissures of particles. And the way that arsenic gets into those cracks and fissures is the same way that water absorbs into the sponge.

What happens is, is if there is an arsenic-containing liquid that comes into contact with these soil particles, it absorbs along the pore spaces and goes into the interior.

So the distinction I'm trying to make for you

is that the interior of the particle, in particular, these larger particles, is the place where a lot of these -- these components that we're looking for reside, in particular, arsenic. And when we did that for other samples, we consistently found it on the interior of the particle, not the exterior.

So, based on that, we have a higher degree of confidence in the conclusion that the USMR emission is not the source of arsenic. It's material that can come to reside on the inside.

So this would be arsenic that was in a liquid form, a water form at some point in the history. And as you mentioned previously, the arsenopyrite, that's a naturally occurring mineral depicted in Fig. 14. And, again, that's on the interior of the particle. And had we, you know -- we didn't have an ability to look into the interior of the particle with the previous techniques.

So when we look -- you know, we don't expect to see USMR particulates migrating into the interior of other soil particles, but the interior is where we come to understand why it is that arsenic can be elevated in these samples with -- among the higher concentrations of arsenic in the study area.

Q. Okay. In places where you found arsenic

you identified them in Exhibit -- in Table 3, right?

A. That is correct.

Q. Okay. And you identified aqueous arsenic, which I think is what you're describing now, right?

A. That is correct.

Q. You identified that in 4143, right?

A. That is correct.

Q. An area that you believe there was fill from U.S. Metals, correct?

A. Maybe not in this particular sample, but 4143 is a big area, and in this particular sample we are identifying the arsenic on the interior.

Q. Okay. And that's at -- what's the depth of the sample with arsenic that you found there?

A. This one is a surface sample, so that would be zero to six inches, as it says on page 39.

Q. 4143-G28-08-DG, it's your testimony that's a surface sample?

A. I'm sorry. I'm looking at page 39, and the sample number is 4143-G16-08-AG-G1881.

Q. Okay. Well, I'm looking at your revised Table 3 --

A. Yeah.

Q. -- which would indicate where you have sources of arsenic, right?

which a handful of samples were sent; is that correct?

A. That is correct.

Q. Okay. We did this exercise last time, so I think I have some answer, but I want to make sure your answers haven't changed.

The fill materials that you began identifying, I've tried to list them here: concrete, wood, glass, asphalt, coke, cinders, brick, paint, coal, ash, rust, clinker, and slag, right?

A. Yes.

Q. Okay. Were there any other fill materials that you can identify for us?

A. The ones we are looking for are enumerated in... let's see.

Q. You mentioned them generally. Construction debris and some other things.

A. So in section 4.2, starting on page 20 and continuing on to 21, we have a list of fill-related materials. There's construction and demolition debris, and that covers a good number of the items you have here. And then there are thermogenic byproducts, and you've got some of them there.

Q. Okay. In any of these that I have listed that you found, did you identify them being in any

instance a source of arsenic?

A. I'm sorry. I can't see the bottom. Is clinker the last one?

Q. Clinker and slag.

A. For arsenic, I don't recall identifying arsenic in any of those. It's possible that they -- they could be in slag. Sometimes there's arsenic in slag.

Q. Okay. So slag is a possible, right?

A. Mm-hmm.

Q. Otherwise you didn't identify arsenic in any of those fill sources, correct?

A. It's not on the surface of it, no.

Q. And, again, you did not identify it one way or the other in those sources, right?

MR. SUTHERLAND: Object to the form.

A. I did not identify arsenic in those samples that you have on that page, no.

Q. Okay. And just to be clear, you did not test every particle from every sample that you analyzed, right?

A. That is correct.

Q. Okay. And in the case of Phase 2 and Phase 3, I believe you sent isolates exclusively; is that right?

A. You asked me about that last time. I went back. We have whole samples -- in the original -- in the data submission that we sent, I would say in the last month, you have -- you have the samples of what we call sub or fines. Those are whole samples. Those are distinct from isolates.

So to go through all those tables and the chains of custody and things like that, you'll see that, with very few exceptions, we -- whenever we did isolates, we also did the whole sample.

Q. What does "sub" mean?

A. It just means it's subsampled from the main archive at ALS.

Q. Okay. Was that done with any selection --

A. No.

Q. -- criteria?

A. (Indicating).

Q. With respect to these sources of fill, concrete you did not find was a source of lead, right?

A. Give me a second. Concrete, no, I did not have any concrete with lead.

Q. Okay. And wood was not a source of lead, correct?

A. Correct.

Q. Glass was not a source of lead, correct?
A. No.
Q. Asphalt was not a source of lead, correct?
A. That's a question mark. We didn't identify -- we didn't have a lot of asphalt.
Q. Okay. But you -- let me just clarify my question. In the asphalt that you analyzed, you did not identify it as a source of lead, correct?
A. That is correct.
Q. Okay. And coke was not a source of lead?
A. That is correct.
Q. Cinders, were they a source of lead?
A. No.
Q. Was the brick that you analyzed identified as a source of lead?
A. Well, sometimes the brick was painted, and, you know, the paint often had lead, so let's say no for the brick.
Q. Okay. Paint, you had some lead paint and some nonleaded paint, right?
A. Correct.
Q. Coal, was that a source of lead?
A. No.
Q. Ash, was that a source of lead?
A. I don't believe so, no.

Q. Rust, was that a source of lead?
A. Sometimes it was.
Q. Okay. And sometimes it was not?
A. Correct.
Q. Okay. Clinker, was that a source of lead?
A. I don't recall. I don't think so, but I don't recall. I don't want to guess.
Q. Slag, was that a source of lead?
A. Sometimes it was.
Q. And sometimes it was not?
A. Correct.
Q. Okay. Concrete, was that a source of copper that you identified?
A. No.
Q. Were any of these a source of copper that you identified?
A. Again, it wasn't the primary focus of what we were looking at, because the concentrations did not motivate any regulatory activity, but the copper -- no, I don't think the copper was in concrete, no.
Q. Okay. Can you identify any of these where your analysis identified copper -- identified these as a source of copper?
A. I mean, copper is in many of the spectrum.

I didn't call it out as a separate column on these tables, but it's not uncommon.

Q. Okay. So can you identify for me which of these sources of fill you identified as being a source of copper?

A. Again, we weren't focused on determining the source of copper.

Q. Okay. So you said concrete was not a source of copper, right?

A. Right.

Q. Okay. Is it your testimony that you can't tell me whether wood, glass, asphalt, coke, cinders, brick, paint, coal, ash, rust, clinker, or slag were identified as being sources of copper?

A. Well, I can tell you, but I have to go through the samples to call out the copper source.

Q. Okay. So you don't know sitting here today, correct?

A. That is correct.

Q. What was the source of copper in the AOC and the transect areas?

MR. SUTHERLAND: Object to the form.

Q. What is the source?

MR. SUTHERLAND: Object to the form.

A. I would attribute it to fill.

Q. Okay. Did you -- where did -- in any of these fill materials that you looked at, where did you identify it being a significant source of copper, if any?

A. I think the question has been asked and answered. I was not -- I was not focused on determining a source of copper.

Q. You're a scientist; I'm a lawyer. I can ask the same question multiple times; your lawyer can object. Okay?

Can you tell me where it's been a primary source of copper?

MR. SUTHERLAND: Object to the form.

Q. Which is a different question. Because now I'm saying primary source or a major source, which may be different than where it shows up as a blip on your spectra.

A. Okay. So we, from my recollection of the copper analyses, the main sources of copper would be paint, would be -- we do find it in slag, and the rest I just don't recall.

Q. Okay. So it's your belief that you found a significant presence of copper in some paint samples as well as some slag samples, correct?

A. That is correct.

Q. Okay. The NewFields' stereomicroscope, what resolution does that microscope have?

A. As I said before, it goes down to about 90, a magnification of 90 times what you would see with your eye.

Q. Does it allow you to identify sub-10 micron particles?

A. No. It does not allow us to identify particles in the micron level, in the micron range.

Q. Okay. And we talked about this. The UMass SEM-EDS was operated by NewFields employees, right?

A. The NewFields SEM was operated by NewFields employees, yes.

Q. Okay. Why was that done at UMass?

A. Wasn't always done at UMass. Sometimes it was done at another laboratory where we have laboratory space called Alpha Analytical.

Q. When you say UMass SEM-EDS, is that the SEM that we're talking about, the NewFields SEM?

A. I'm sorry. The comment I just made was about NewFields SM. If we're moving over to the next column, the UMass SEM-EDS is -- it doesn't move. It's at the Boston campus at the University of Massachusetts.

Q. Okay. I was asking you about the SEM.

A. Okay. Sorry.

Q. Your response was the NewFields SM, I guess. And so now we can clarify.

NewFields operated a stereomicroscope that they operated both at Alpha and at UMass, correct?

A. Yes.

Q. Okay. And they went to Alpha and actually analyzed a couple hundred samples, screened them at Alpha, right?

A. There was a number of analyses that were done at Alpha. There were a number of analyses that were done at UMass. This is a small microscope. It's about this big (indicating), and we can move it where we need to go. Some of the analyses were done at ALS, at the laboratory where the samples are archived. So we've done it in different locations.

Q. Okay. And that was used to screen for indicators of these fill sources which you believed might be associated with a source of arsenic or lead, right?

MR. SUTHERLAND: Object to the form.

A. It's used to do an initial assessment of the particles. It's not specifically targeting fill. It's targeting -- if anything, its primary target is

things that could be coming from USMR. We were trying to -- we were trying to find the ash or the emissions from USMR.

So if after looking at it with the stereomicroscope and we saw fine materials, we would consider the concentrations that had been measured in those samples and we would take a representative number of samples and take them on for further considerations.

If, for example, the sample was a rock, right, and, you know, it was of a size that was well in excess of anything that the USMR plant could have emitted, then we didn't really need to do much with it.

Q. What's the smallest particle size that that stereomicroscope could get resolution on?

A. I would have to -- I'd have to look at the specifications of the microscope to figure out how small it can go.

It's not hard to see if you have a lot of fine material in these particles, especially when you look at the samples with the stereomicroscope. If you see a bunch of samples and a bunch of particulates that are very fine, that would be a candidate for something we'd want to look at.

Q. Okay. I didn't find that type of discrimination anywhere in the documents that you produced. Was that just something that was done on the fly by Gang Hu?

MR. SUTHERLAND: Object to the form.

A. No, it wasn't done on the fly. We went in with an approach, a technical approach, that we reviewed earlier -- it's in the report -- and based on the concentration -- I'm talking about Phase 2 here -- based on the concentration, this is where we did a lot of the stereomicroscopy screening, just to be clear -- that was Phase 2 -- that initial screening with the stereomicroscope came in and played a central role for Phase 2.

Q. So I understand that's how you picked the samples to look at, but then you looked at them with the stereomicroscope, right?

A. Yeah.

Q. Okay. And then you did not send them all to a lab for further compositional and more detailed microscopic analysis, right?

A. That is correct.

Q. Okay. And so I'm asking if what you did was you screened them and where you found evidence of something that may be contributing lead or arsenic,

you sent those to either MVA or to Geller or to UMass for further analysis, right?

A. Based on the criteria in Table 2, yes.

Q. Okay. So the criteria that was in Table 2 was what you pulled the samples to begin that process at the start of NewFields' stereomicroscope, right?

A. Right.

Q. And then you sent those samples, 300 or so in Phase 2 and another 150 or so in Phase 3, through that process. And all I'm getting at is what made it from Phase -- from the NewFields' stereomicroscope beyond that.

A. Okay.

Q. And it seems like it's where there was some indication stereomicroscopically that there may be a source of lead or arsenic at play, right?

A. The criteria is what we're looking for is a wide range -- the first criteria is do we have fines, because that would -- that would be the best way to find the USMR emission.

And the second criteria is what represents the widest range of particles that we are seeing among samples that we have looked at that satisfy the criteria in Table 2, of those samples, which ones have the widest range of particle types, assuming

that they contain the fines to start with.

Q. Okay. We talked earlier about this. If a sample was sent to MVA, it would have entries in here for MVA's analysis, right?

A. That is correct, yes.

Q. And if it was sent to one of the other labs, it would likewise have an entry, right?

A. That is correct.

Q. Can you tell me how many samples went on for further analysis?

A. Yes.

Q. You're just going to do that by tallying them up?

A. Yes.

Q. Okay. And if they did go on for further analysis, if we were sitting here with Excel we could just count the number of nos, right? Because they would have a no.

A. I'm sorry. Can you say that question one more time?

Q. We could count the USMR emission no, because you didn't identify a single yes, and we could count up those nos and we would know what went to one lab or the other.

A. That would be a reasonable approach.

A. That is correct.

Q. Okay. Those are not samples that Arcadis analyzed, right?

A. The samples on row 405 to the bottom were, let's see, yeah, were not -- were not collected by Arcadis.

Q. And they were not collected according to Arcadis sampling and analysis protocol, correct?

A. That is correct.

Q. And some of those were taken close to the home or close to fence areas or close to excavated areas that were otherwise not a part of Arcadis's sampling protocol, right?

MR. SUTHERLAND: Object to the form. Go ahead.

A. The samples were not collected in accordance with Arcadis's sample plan.

Q. Okay. And there were no setbacks used for lead paint or for arsenic-treated wood, correct?

A. There were -- there were no setbacks for, no, there were no setbacks.

Q. Okay. So you went out and you actually had, without a microscope, visual in some cases at least identification of paint chips, and you sampled material that included those paint chips, right?

Q. Handing you Exhibit 739. Can you identify Exhibit 739?

A. Yes. This is a proposal dated March 8th from myself to Mr. Sutherland scoping out Phase 2.

Q. Okay. And in that proposal you say, "the samples will be analyzed to confirm the presence of anthropogenic fill," right?

A. Yes.

Q. Okay. So I asked you if you screened with a NewFields microscope to find indicators of fill, and you said, well, that's not the only thing, but that was the objective, right?

A. Well, I'm saying anthropogenic fill, recognizing it includes -- it's a genericization of what we're looking for. Anthropogenic fill includes ash, for example.

So I'm not distinguishing USMR emissions from what we are scoping here under the umbrella of anthropogenic fill. We wanted detailed characterization of things that are not natural.

Q. And you say there, on March 8th of 2018, you say, "soil boring reports employ a wide range of particle descriptions that consistent with fill," right?

A. Yes.

Q. So you had seen the soil boring logs by that time, right?

A. Yes.

Q. Okay. And you knew that they identified terms consistent with fill, right?

A. Yes.

Q. Okay. And then it says:

This phase of the investigation will confirm the presence -- the presence estimate -- the presence estimate the proportion of fill using stereomicroscopy and polarized light microscopy.

Right? Estimate the proportion of fill, did you do that?

A. No.

Q. Did you do Phase 2?

A. Because it was all fill.

Q. Okay. Everything was fill, or there was just an indication of fill in every sample that you looked at?

A. The characterization that it was overwhelmingly fill is accurate. I mean, I didn't need to say, you know, this is the amount of fill when the layers are just completely fill.